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ABSTRACT

A behavioral treatment program was used to improve the functional skills of a 12-year-old anoxic child. Neuropsychological test results indicated marked amnesia and global cognitive deficits. Functionally, self-care tasks could be performed, but only with verbal and physical prompting. Introduction of a monetary reward system significantly reduced the number of verbal cues and physical prompts necessary to produce the targeted behaviors of toileting and dressing. Results indicated decreases of 80 percent in the number of verbal prompts and 70 percent in the number of physical prompts required to complete dressing, and reductions of 92 percent and 75 percent in the verbal and physical cues necessary to complete toileting. Decreases were also obtained in the time taken to complete these tasks. The findings support the continued use of behavioral procedures with patients with severe brain injuries despite the presence of marked cognitive deficits. (Author/JDD)

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IMPROVING FUNCTIONAL SKILLS USING BEHAVIORAL PROCEDURES IN A CHILD WITH ANOXIA

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ABSTRACT

Using a multiple baseline across behaviors design, a behavioral treatment program was used to improve the functional skills of a 12 year old anoxic child. Neuropsychological test results indicated marked amnesia and global cognitive deficits. Functionally, self-care tasks could be performed, but only with verbal and physical prompting. Introduction of a monetary reward system significantly reduced the number of verbal cues and physical prompts necessary to produce the targeted behaviors, toileting and dressing. Results indicated decreases of 80% and 70% incidence in the number of verbal and physical prompts required to complete dressing, and reductions of 92% and 75% in the verbal and physical cues necessary to complete toileting. Behavioral procedures can be of assistance in improving functional abilities despite marked cognitive deficits.

Introduction

Patients with prolonged ischemic anoxia typically suffer structural damage to specific areas of the brain including the cerebral cortex, hippocampus, cerebellum, and basal ganglia (Caronna, 1979). Surviving patients may manifest marked motor, sensory and cognitive deficits which recover slowly. These patients represent a challenge to rehabilitation programs. Behavioral approaches have been successfully implemented with severely brain injured patients to remediate functional skills (Cohen, 1986, Giles & Morgan, 1989). However, most investigations have been limited to uncontrolled case studies. Using a multiple baseline across behaviors design, the successful use of a behavioral treatment program to improve the adaptive abilities of an anoxic child is described.

Method

Subject

- 12 year-old black female
- Near drowning accident in a wave pool
- Submerged 5 minutes
- At rescue, full cardiac arrest
- After 21 minutes of resuscitation, weak pulse obtained
- At local hospital, GCS = 3
- Transported to trauma center, GCS = 5 on arrival
- Hospital day 2, EEG read as abnormal with marked diffuse slowing and prominent spindles
- CT scans on hospital days 2 and 4 interpreted as WNL
- Hospital day 5, localized motor responses with spontaneous eye opening (GCS = 9-11)
- One month post-injury, able to follow simple commands but nonverbal
- Appropriate use of single words (2 months post-injury)

Neuropsychological Evaluation
(3 Months Post-Injury)

Behavior	• Moderately agitated and distractible • On-task attention span < 30 sec
Visual	• Fields full without neglect • Impaired discrimination and constructions
Language	• Reduced speech output with little or no social speech • Whispering words and phrases • Repeated 6 digits forward; 0 backwards • Matching pictures to spoken words = 67% correct (field of 4), but impaired in following more complex requests
Memory	• Oriented to place, grossly disoriented to time (COAT = 65) • Recalled 3/4 nouns at 1 min., 0 at 2 min.

Intelligence	•	VIQ = 48, PIQ = 46, FSIQ = 42 on WISC-III
Observation	•	On-task behavior and task performance improved with monetary rewards (one penny per correct response)

Functional Evaluation

- Able to perform self-care (grooming, dressing, toileting)
- Only able to perform self-care tasks with verbal prompting and physical assistance
- Distractibility, poor motivation, and lack of initiation undermined performance
- Repetition of instructions necessary to complete actions
- Apraxia evident for fine motor skills

Procedure

Given her improved on-task behavior using monetary rewards, self-care activities were targeted for intervention. Two classes of behavior were targeted: (1) toileting-undressing, pulling down one's pants, etc., and (2) dressing-putting on undergarments, bra, socks, lacing and tying shoes, etc. Baseline recordings were obtained by the occupational therapist. Following three days of baseline, treatment was introduced for the first target behavior, dressing. During this phase, she was told she would receive a penny for each accurately completed step. Treatment was next applied to toileting after six baseline sessions for that behavior. Subsequent to the fourth treatment session in which both behaviors were targeted, fading of the reinforcement conditions was initiated. Use of monetary rewards was discontinued for the final three sessions of treatment prior to discharge. Duration of the program was 25 days.

Results

The results of the behavioral intervention across the two classes of behavior are shown in Figure 1. During baseline, an average of 28.0 verbal cues and 10.67 occurrences of physical assistance were necessary to accomplish dressing with no observed change in toileting behaviors. Introduction of the monetary reward resulted in a dramatic reduction in the number of verbal cues (9.71) and physical prompts (5.57) necessary to accomplish dressing with no observed change in toileting behaviors. Baseline data on toileting revealed that an average of 21.67 verbal cues and 6.16 physical prompts were used. With the introduction of the reward system, verbal cues and physical prompts decreased to an average of 4.0 and 1.5 respectively. During fading of the reinforcement conditions, further reductions in the number of verbal cues and physical prompts were evident for both classes of behaviors (See Figure 1). By the completion of training, decreases of 80% and 70% incidence in the number of verbal and physical prompts required to complete dressing, and reductions of 92% and 75% in the verbal and physical cues necessary to complete toileting respectively were observed from baseline levels. Concomitant declines in time to task completion are also presented in Figure 1. Six month follow-up with the patient's mother suggested that treatment gains were maintained although distractibility and apraxia remained limiting factors.

Discussion

Overall, the results indicated that the number of verbal cues and physical prompts necessary to accomplish the targeted functional skills were reduced with the introduction of the reward system. Decreases were also obtained in the time to complete these skills. Unfortunately, due to the severity of patient's cognitive and motor deficits, i.e. inattention to task, distractibility, and apraxia, complete withdrawal of cueing prior to discharge was not accomplished. However, the decreased level of supervision and reduced time to complete these tasks permitted simplified home care. The findings support the continued use of behavioral procedures with severely brain injured patients despite the presence of marked cognitive deficits.

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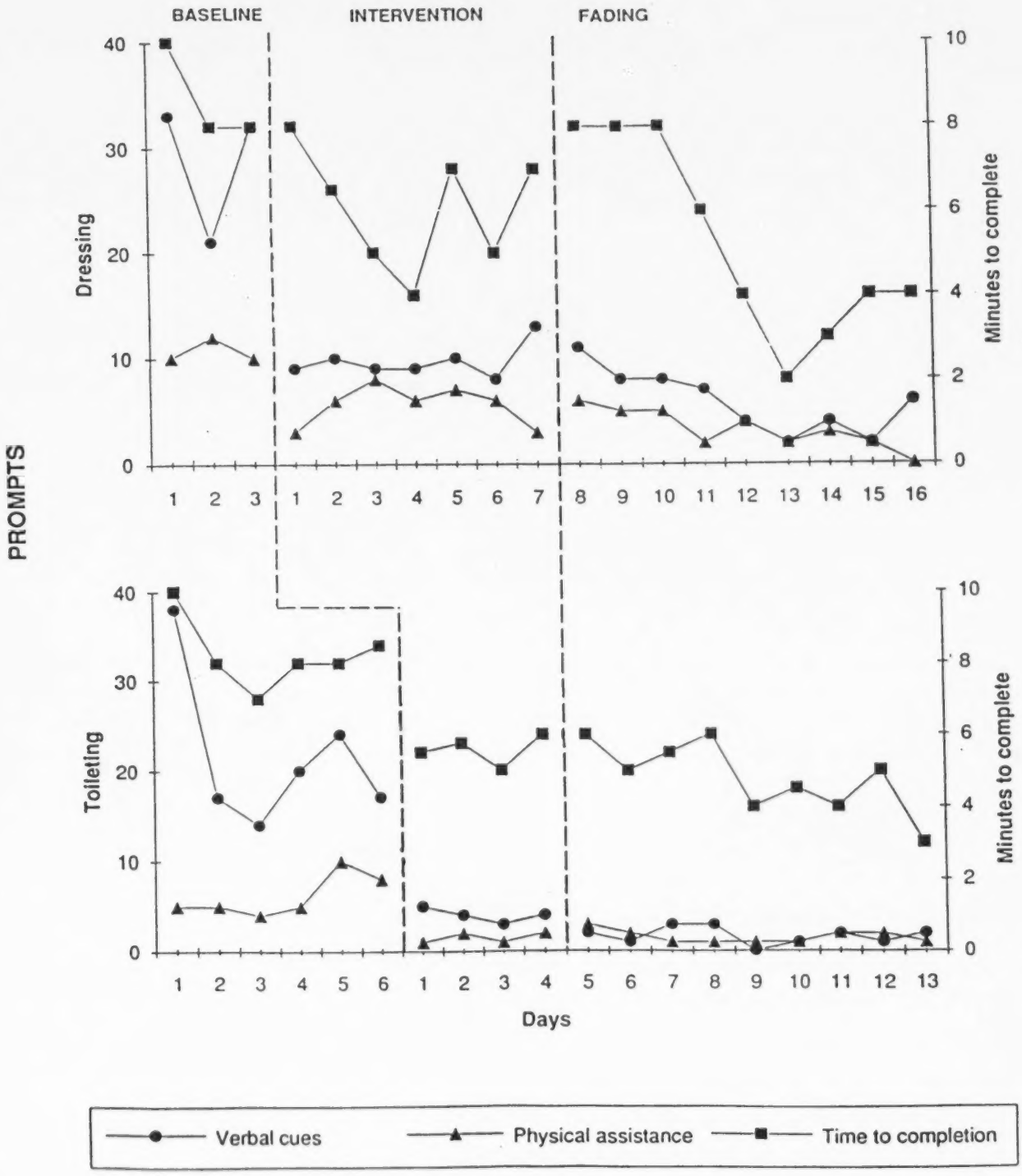

Figure 1. Number of verbal cues and physical prompts and time to task completion for dressing and toileting.